

# Nitrogen Dioxide

## **What is nitrogen dioxide?**

Nitrogen dioxide (NO<sub>2</sub>) is a red-brown gas produced when fuel burns. It is present in vehicle exhaust and the fumes from burning fuel oil, kerosene, propane, natural gas or wood.

Appliances such as gas stoves, portable heaters, fireplaces, and gas-fueled clothes dryers may produce this gas. When NO<sub>2</sub> is exposed to water, it can form nitric acid, which is a chemical that contributes to acid rain. Nitrogen dioxide is also a major cause of smog.

## **How can I be exposed to nitrogen dioxide?**

People are exposed to NO<sub>2</sub> by breathing in the gas from polluted air. The levels of NO<sub>2</sub> are usually higher outdoors than indoors. The operation of gas or diesel engines in indoor areas can result in a build up of dangerous levels of NO<sub>2</sub> in the air. For example, several hockey players were poisoned by NO<sub>2</sub> when a fuel-powered ice-resurfacing machine released this gas into an indoor ice skating rink. The players experienced severe coughing and other flu-like symptoms.

In addition to fuel powered engines, home appliances, such as gas ovens, furnaces, and wood stoves can also release NO<sub>2</sub> into the air. When these energy sources burn fuel incompletely, there is the risk of NO<sub>2</sub> being produced. In silos, NO<sub>2</sub> can also be released by corn, hay, silage, or grain as they ferment. Gases produced by electric arc welding may also contain dangerous levels of nitrogen dioxide. Traces of NO<sub>2</sub> can be found in tobacco smoke.

## **What are the effects of exposure to nitrogen dioxide?**

Breathing low levels of nitrogen dioxide can cause a slight cough, mild fatigue, and nausea. Eye, nose, and throat irritation are also common symptoms. At high concentrations, NO<sub>2</sub> can cause severe coughing, choking, headache, nausea, abdominal pain, and shortness of breath. If the exposure is severe, symptoms may continue after the exposure has ended, causing difficulty breathing for weeks.

## **How can I avoid being exposed to nitrogen dioxide?**

- Have gas appliances professionally inspected each year.
- Be sure that all gas appliances are properly vented to the outdoors.

- Keep fireplace flues fully open and clear of obstructions when in use.
- Never idle a car inside a garage or car port.
- Make sure that wood stoves are correctly installed and vented.
- Have your home heating system and chimney professionally inspected each year.

### **What should I do if I suspect a problem?**

If you suspect NO<sub>2</sub> exposure, and can identify the source (e.g. a gas engine), turn off the source and get fresh air into the area. Open windows and doors. Use a fan if necessary to increase air circulation.

If you experience unexplained symptoms such as cough, fatigue, eye and nose irritation that go away when you leave home, NO<sub>2</sub> poisoning may be occurring in your home.

Elderly people, young children, and people with chronic respiratory diseases, such as asthma and emphysema, may be very sensitive to NO<sub>2</sub>; they should be evacuated. If the symptoms are causing discomfort or if they are persistent, consult your doctor.

If you suspect that a device in your home, such as a stove, is releasing NO<sub>2</sub>, call your local gas utility or a heating contractor for a home inspection. Once the NO<sub>2</sub> source is identified, repair, replacement, or proper ventilation of the appliance can eliminate the problem.

### **For more information**

- Contact the Wisconsin Division of Public Health, Bureau of Environmental Health, PO Box 2659, Madison, WI 53701-2659, (608) 266-1120; or
- Visit the department's website, [www.dhfs.state.wi.us/eh](http://www.dhfs.state.wi.us/eh)



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